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February, 1959 35c

Texas Highways

Divided Overpass on Eastex Freeway, Houston

Texas Highways

Volume 6 • Number 2

February, 1959

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Official Departmental Map 1959

Like an ocean shore line which is constantly rearranged by the working tide, the highways of Texas, too, make a continual break with yesterday. Somewhere each day on the webwork of state roads, men add new miles or change the existing alignment or surface make-up of the old miles. Because of this, no charted likeness of the highways printed one day is totally the same 24 hours later.

When professional road engineers, state highway commissioners, or contractors and materials men reach for a map, the latest and most authoritative to work from is the map issued every three months by the Road Inventory Section of Planning Survey Division and known as the "Official Departmental Map."

This month when its hundreds of regular users snap open the first quarterly edition of the year, they will see immediately that time and tide have jogged the elbow of the map maker more forcibly than usual. One glance will tell that the new map contains more information which is presented in a more legible style.

Transformation of the Official Departmental Map was far from an overnight job. It required the full time of a staff of four draftsmen over a period of six months. Jack Jordan, Inventory Manager of the Road Inventory Section, pointed out the new edition's modernizing improvements which were made by the men who spend their workday keeping Texas highways located on the Departmental Map.

The total map is created each quarter, Jordan explained, from a basic one. This "basic" to the map draftsman is as much a starting point as is the dark suit around which a man plans his wardrobe. It is this basic map which has been undergoing a thorough revamping, county by county, on the drawing boards in Road Inventory Section.

The decided improvement in the physical appearance of the Official Departmental Map is due chiefly to the fact that the scribe process was used in the drafting of its basic framework, Jordan said. Scribing—a mechanical technique in which needles and blades of varying widths are guided across emulsion-covered film—produces sharper and more uniform lines. (The first popularly distributed map to be scribed by the Department was the 1957 Official Highway Travel Map produced by Information and Statistics Division. See TEXAS HIGHWAYS, July 1957. In a statement from Tom Kennedy of the Bureau of Public Roads Washington office, the Department was recently lauded as the first highway department in the nation to adopt the new map-making technique. Twenty-eight county maps have been scribed by Planning Survey Division during the past four years.)

Nolen Williamson, Office Engineer in charge of compilation and content of the revised map, said the map has been scribed in three sections, three feet by nine feet each. The sections are combined and reduced to a three-foot-square negative on emulsified film. According to records kept by Road Inventory Section at its sales counter in the Austin office, this three-foot size is the one most sought. Its numerical distribution exceeds more than twelve-to-one that of the larger sizes which the Section can supply. Such six- and nine-foot-square maps contain the same information as the popular small size. A commercial printer turns out the small ones; the six- and nine-foot sizes are made in the Reproduction Section of Operations Division.

The main addition in content was inclusion of Interstate Highways.

In scribing, the first draft is made on emulsion-covered film and is scraped with blades of varying widths. Here, guiding the scribing instruments are Joe Mitchell, Area Supervisor (left), and Woody Hubbard, Junior Draftsman (right). R. H. Spiller Jr., Senior Office Engineer who supervised the actual drawing, looks on.

Numbers, symbols, and all lettering on the new map were clipped from printed pages such as this, then pasted in the proper slot on the original draft.

The finished map gets a final pat of precision folding by Jim Shurtleff, (left), and Bill Wertz, (right), both Junior Recorders. They are shown where the folds should go by Nolen Williamson, Office Engineer in charge of compilation and content of the revised map.

Mailing the three-foot-square map, which goes quarterly to a list of users within the Department and outside, are Ann Ayers, Planning Survey Clerk, and Tommy Adams, Junior Recorder.

Whether designated, under construction, or finally constructed, these highways are now a part of the map's information.

R. H. Spiller Jr., Senior Office Engineer, who supervised the actual drawing, called attention to the fact that on the new map all road bands are narrower than those formerly used. U. S. and State Highways are indicated by the widest lines—permitting easier location of the main highway system. Farm-to-market and park roads are shown by a narrow line. Highway districts are still numbered and outlined in blue, Spiller said.

Numbers, symbols, and all lettering on the restyled map are more legible. Ordered custom-made from a commercial lettering firm, these figures are called transadhesive lettering and are clipped from a printed supply and applied to the proper location on the original draft of the map.

A mailing list of more than 700 persons, both within the Highway Department and outside, receives the Official Departmental Map each quarter. The map is sold completely or by the section to individuals and companies not connected with the Department.

Right of Way Division Reports

After the Federal Aid Highways Act of 1956, it was, of course, decided that the State of Texas would go into the right of way business. In preparation for the setting up of a program in Texas, officials of the Highway Department traveled extensively over the country observing the programs of the various states which already had years of experience in right of way acquisition and financing.

In the tete-a-tete which followed this road work, an attempt was made to extract from each program observed the features which were the most economical and expeditious to the State and fair to the property owner. After these features were combined, we felt we had a good start toward a solid right of way program.

Texas is one of the babies of the right of way buying family, and it is only natural that when entering into any new program or era, occasional misgivings may arise with respect to policy and procedure. It is all the more reassuring to us, then, when we receive evidence that any policy decision which was made at the inception of our program was a wise and equitable decision.

Such evidence was afforded recently when the State of Michigan, an old-timer in the right of way buying field, abandoned its policy of "horse trading" with property owners and went to a fixed-offer system of negotiating such as we have employed from the beginning. The following is a reprint from an article which appeared in the September issue of "Better Roads":

Acquisition of Right of Way

A new system of right of way acquisition for the Michigan State Highway Department is designed to eliminate "horse trading" with property owners.

According to John C. Mackie, state highway commissioner, the old system had to be revamped in order to acquire the 50,000 acres of land needed for the $1,250,000,000 highway construction five-year program during the next few years.

The new system has been in use in some areas for the past few months. It includes the following:

1. A requirement for two independent appraisals from qualified sources outside the highway department of any parcel valued at more than $25,000.

2. Rigid and far more extensive requirements for detail in all appraisals.

3. Rigid completion dates for all independent appraisals.

4. Creation within the highway department of an appraisal section solely concerned with supervising and expediting appraisals by outside real-estate consultants and reviewing appraisals before an offer is ever made to the owner.

5. Once an appraisal has been approved and turned over to a right of way representative of the department, he is ordered to stick by the established price.

"I want to eliminate the old system where the state might offer a low figure, the property owner demand an unreasonable price, with a middle-ground compromise necessary to resolve the question," Mr. Mackie said. "More extensive appraisals will cost more but will pay off in quicker settlements and if we must go into condemnation to get property, they will stand up better in the courts."

According to Mr. Mackie, completion dates are an absolute necessity for appraisals. In the past some appraisals in Michigan dragged along for more than a year.

The department's policy is to pay the property owner a fair cash market value for his property, a price that will neither enrich the owner at the expense of the public nor the public at the expense of the owner.

The Michigan department does not expect this right of way policy to eliminate differences of opinion, but, Mr. Mackie said, "We are hopeful this policy will better assure our offer is fair and equitable as well as expedite the highway program."

QUANTITY—YES

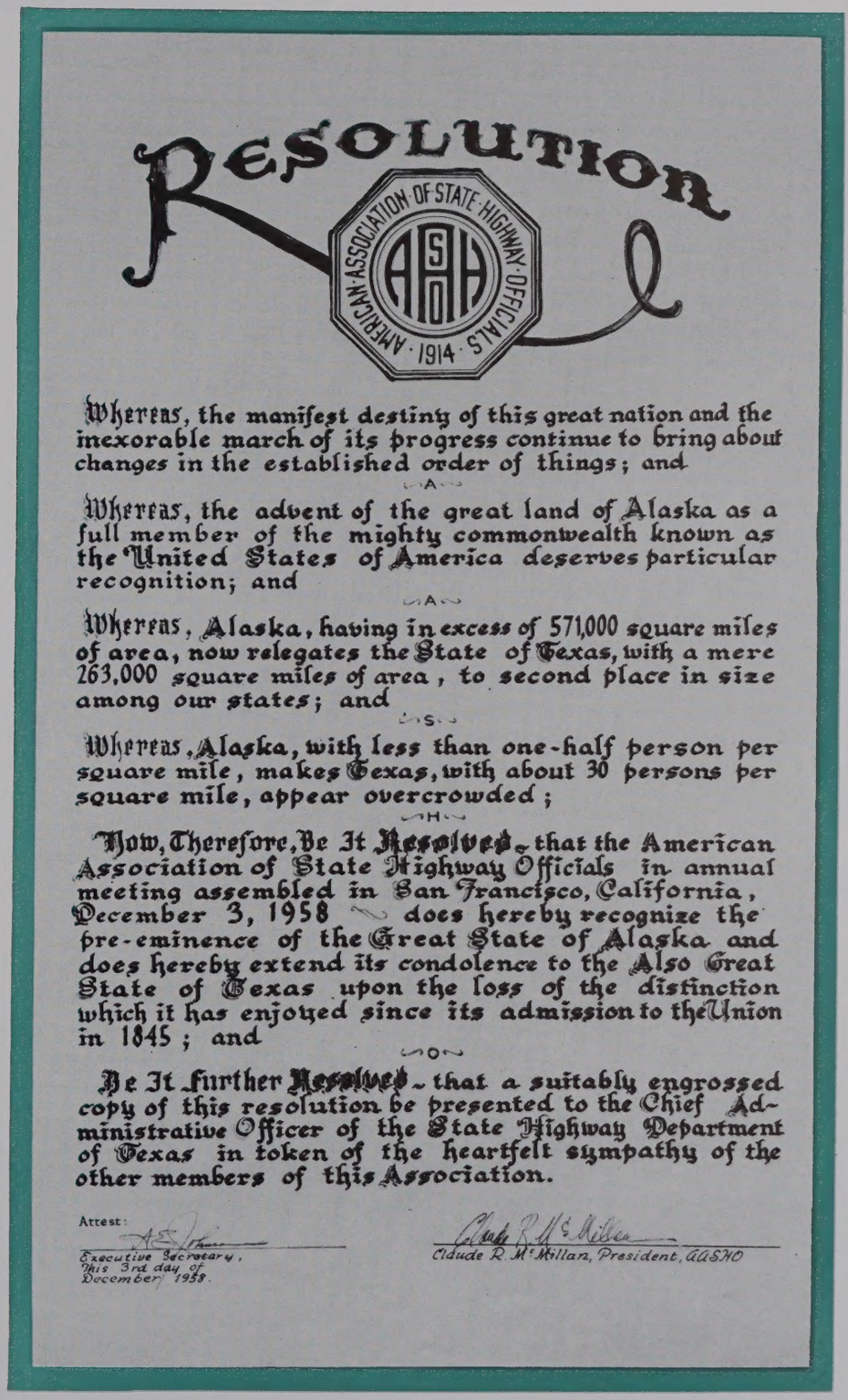
Quality

?

Since the time it became evident, by act of Congress, that Alaska was to be admitted as the forty-ninth state and thereby usurp Texas' laurels as the largest, the Texas Highway Department has received several tongue-in-cheek expressions of sympathy.

Perhaps the most impressive ribbing came from the American Association of State Highway Officials during its recent San Francisco meeting. State Highway Engineer D. C. Greer was the recipient of this beautiful document rendered in black, gold, red, and green.

Texas may no longer be the biggest state, but we have yet to see a bale of Alaskan cotton, a bushel of Alaskan pecans, or a vase of Alaskan bluebonnets. And also, we haven't heard any reports of Alaska laying claims to having 57,000 miles of the finest highways in the world—nor for that matter, has outer space.



RESOLUTION

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS · 1914 · AASHO

Whereas, the manifest destiny of this great nation and the inexorable march of its progress continue to bring about changes in the established order of things; and

Whereas, the advent of the great land of Alaska as a full member of the mighty commonwealth known as the United States of America deserves particular recognition; and

Whereas, Alaska, having in excess of 571,000 square miles of area, now relegates the State of Texas, with a mere 263,000 square miles of area, to second place in size among our states; and

Whereas, Alaska, with less than one-half person per square mile, makes Texas, with about 30 persons per square mile, appear overcrowded;

Now, Therefore, Be It Resolved, that the American Association of State Highway Officials in annual meeting assembled in San Francisco, California, December 3, 1958 does hereby recognize the pre-eminence of the Great State of Alaska and does hereby extend its condolence to the Also Great State of Texas upon the loss of the distinction which it has enjoyed since its admission to the Union in 1845; and

Be It Further Resolved, that a suitably engrossed copy of this resolution be presented to the Chief Administrative Officer of the State Highway Department of Texas in token of the heartfelt sympathy of the other members of this Association.

Attest:

Executive Secretary,
This 3rd day of
December 1958.

Clyde R. McMillan, President, AASHO

Marine Operations

O. I. Rader, District Administrative Engineer
District 12

The Gulf Intracoastal Waterway parallels the Texas Gulf Coast from border to border through Districts 20, 12, 13, 16, and 21. Of the ten highway crossings in the state, one is the county causeway at Port Isabel, another is the county bridge between Corpus Christi and Padre Island, and one is on S. H. 87 near Port Arthur. The remaining seven are in District 12.

In the years 1940 to 1942, the Texas Highway Department constructed five one-way pontoon bridges across the canal in Brazoria and Matagorda Counties. These bridges utilized a 100-foot-by-18-foot timber barge to span the channel, with arrangement for swinging the barge clear of the channel for water-borne traffic.

At that time there were two bridges across the canal in Galveston County, the swing bridge on S. H. 124 near High Island and the Galveston Bay Causeway with bascule spans on U. S. 75.

Barge traffic on the lower section of the canal was then comparatively light. Even so, extensive damages to the bridge approaches and fender systems occurred frequently, and with the unexpected increase in canal traffic it soon became apparent that maintenance of these crossings would require a specialized permanent organization.

In 1943, a small shipyard with marine railway was built at Surfside for the maintenance of the timber-pontoon bridges, and a regular maintenance organization was established.

These pontoon bridges provide access to the Gulf beach, and the section opened has become increasingly popular with fishermen and boating and bathing parties from a large area. Numerous summer cottages have been built along the beaches.

Since these crossings provide their only means of egress from the beach area, the people depend upon them for trafficways at all times. At the time of an impending hurricane they are operated as long as the elements will permit. The barges are then sunk in open position to prevent them from being carried away by wind and waves. After the storm the barge is raised, the engine disassembled to remove salt water, and the bridge soon placed back in service.

On a number of occasions these barges have been put out of commission by canal traffic, usually through damage to the timber-trestle approaches. Such an incident usually requires the use of a small barge and towboat to ferry the stranded cars back to the mainland.

The original one-way floating bridge at Surfside was rebuilt in 1946 at our own shipyard to provide for two-way traffic to the Gulf beach. Due to the continued industrial growth of the Brazosport area and heavy travel to the beach, this floating bridge was replaced in 1954 by a high-level, fixed-span bridge.

The small original force begun in 1943 has grown to one that, including bridge tenders, now numbers 66 employees. W. E. Kay, Marine Superintendent in charge of this unit, is assisted in the supervision of this work by Thomas Nixon, Construction Foreman; and A. E. Nixon and L. D. Pollack, Marine Foremen.

In addition to the seven crossings of the Intracoastal Canal, there are six other highway bridges across navigable streams in District 12 where there is a substantial amount of water traffic. Of these thirteen bridges, three have fixed spans and the remaining ten, with swing or lift spans, require bridge tenders to be on duty 24 hours a day. These bridge tenders make up a large part of the force under Kay's supervision. All of these bridges have fender systems which require maintenance and repair.

District 12's annual maintenance budget provides approximately $265,000 for maintenance and operation of these bridges. This does not include the cost of unforeseen repair work, which usually adds up to about this same figure.

Prior to 1955, practically all of the heavier repair work was done with rented equipment, particularly pile driving and work of that nature. In that year the work barge *P. T. LIPSCOMB* was built by a Port Arthur shipyard for this purpose. This barge measuring 65 feet by 36 feet by 6 feet 6 inches, carries complete pile-driving equipment consisting of a stiff-leg derrick with three-drum, diesel-powered hoist; 60-horsepower boiler, and hammer.

A unique feature of the barge is the provision for self-propulsion by two 85-horsepower diesel engines. This eliminates the need for a tender, and gives the barge much better maneuverability as well.

This barge was named for a former Assistant District Engineer of this District who will be remembered by many of our readers. The craft and

M. D. Cook, Skilled Laborer from the Angleton Maintenance Warehouse, replaces a lamp on a mast of the S. H. 333 swinging bridge over the Gulf Intracoastal Waterway at Surfside. »

its crew are kept busy throughout the year maintaining facilities, some of which Lipscomb had a hand in building.

In time of emergency it often becomes necessary to work around the clock to make repairs to bridges. On two occasions in the last five years the Galveston Causeway has been struck by barge tows with sufficient force to cause much damage. It becomes necessary to route traffic over the old causeway for short periods while repairs are being made.

In May, 1955, the swing bridge at High Island was knocked off its base by a barge tow. We were able to maintain light one-way traffic across the span while a complete temporary bridge with swing-barge span was being constructed alongside. This was completed in eight days. Permanent repairs to the damaged bridge were then made.

Two other features in this District of special interest to our inland readers have been covered in earlier issues of TEXAS HIGHWAYS. These are the Baytown-La Porte Tunnel and the Galveston-Bolivar ferries. Ferry service provided by the two boats placed in operation in 1950 will soon be augmented by a third ferry now under construction in Port Arthur.

All marine operations in the Houston District are under the supervision of V. M. Craven, Senior Marine Superintendent and long-time employee of this District. Craven has served as Maintenance Foreman and Ferry Manager prior to his present position.

A mechanical engineering section supervised by F. W. Brown, Senior Resident Engineer, handles engineering matters of this nature pertaining to marine operations. This section is currently engaged in designing and supervising construction of the mechanical features of a new two-lane floating bridge near Freeport, which will replace the present crossings at Quintana and Bryan Beach. Delivery of a 125-foot-by-30-foot steel barge for this crossing has been made. Grading operations on the approaches are under way, and the bridge should be completed this year. The group also handles design and inspection of all types of marine facilities including the work barge and the new ferry under construction at Port Arthur. Mr. Brown and his crew, incidentally, are providing plans and construction inspection for all buildings planned and under construction throughout the District.

Cook operates controls of the barge on the Surfside swinging bridge.

Under its own power, the Surfside bridge swings outward—clearing the way for approaching waterway traffic.

A shrimp boat passes through the open bridge.

Wayland E. Kay, Marine Superintendent, District 12; and Ora I. Rader, District Administrative Engineer, District 12, inspect marine tracks at Surfside which are used to haul equipment out of the water for maintenance and repairs.

Along with Thomas Nixon, Construction Foreman, Rader and Kay inspect the new F. M. 1495 crossing presently under construction on the Gulf Intracoastal Waterway.

Thomas Nixon, Construction Foreman, tries out controls of the new swinging bridge to be installed on the F. M. 1495 crossing on the Gulf Intracoastal Waterway.

As a free service to motorists, the Department's ferry R. S. STERLING provides regular water-borne transportation between Galveston Island and Port Bolivar.

The work barge P. T. LIPSCOMB had its keel wet for the first time as it was launched in Port Arthur during 1955.

Leroy E. Rabel, Skilled Laborer from West Columbia, operates cranes on the P. T. LIPSCOMB. »

The P. T. LIPSCOMB regularly plies the Waterway performing maintenance and repair operations.

J. D. Ford, foreground, and C. C. McKnight, background, Skilled Laborers, apply welding torches to a new work barge presently under construction at the Angleton Maintenance Warehouse. »

CAT

OVERBOARD

A thirteen-ton D-7 Caterpillar is a common sight in highway construction areas over Texas. But when such a machine is lying in fifteen feet of water, upside down, and stuck in deep mud—the circumstances surrounding the event become points to ponder by our maintenance men.

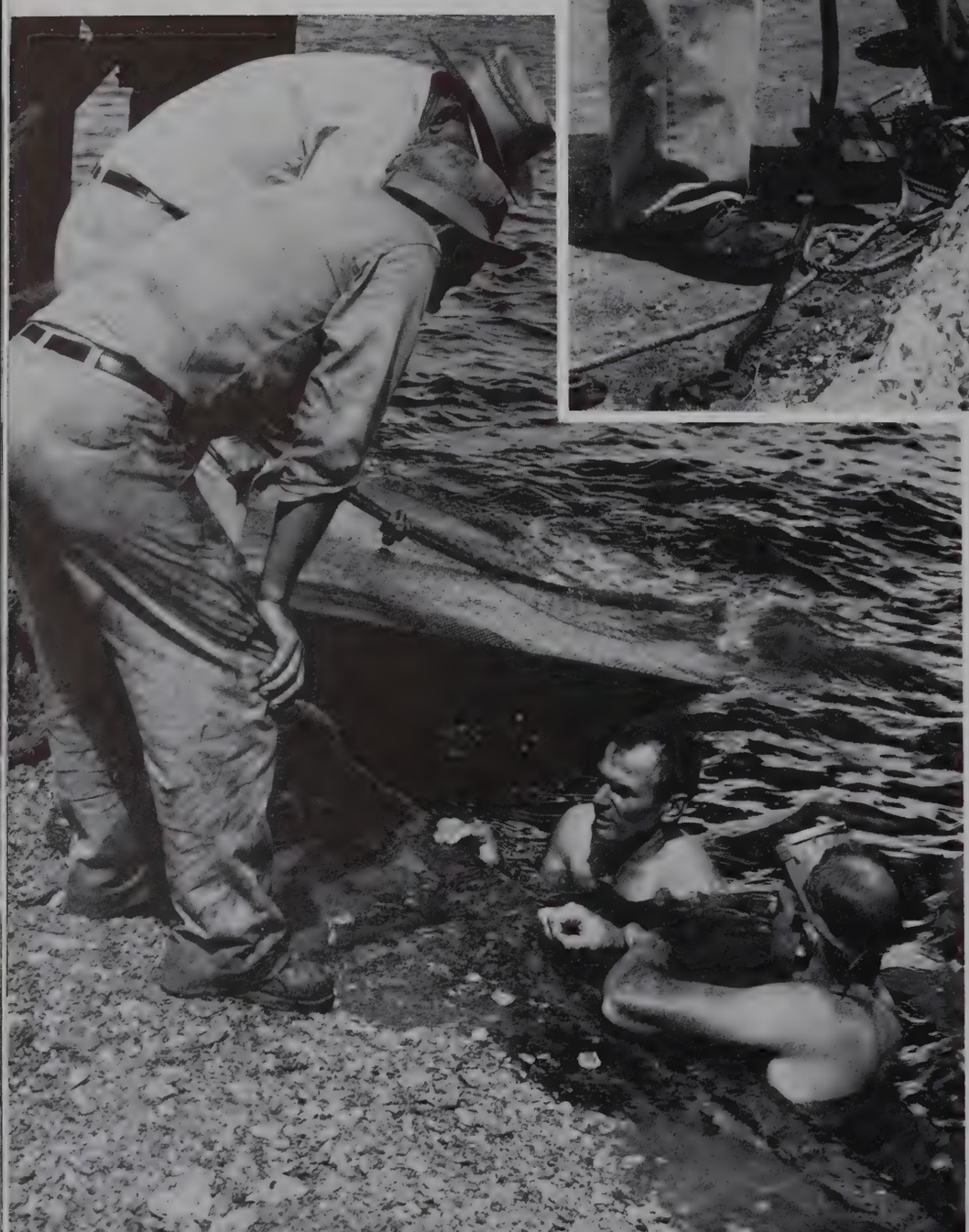
Last September 16, about 11 a.m., a construction-company truck loaded with a Caterpillar was proceeding northeast across the Lavaca Bay Causeway between Port Lavaca and Point Comfort. The height of the truck and the Cat on its bed, and the height of the wind portal of the single-bascule span on the causeway did not permit clearance. The truck collided against the wind portal with sufficient force to break the chains holding the tractor to the truck bed. Traveling on down the causeway out of control, the truck came to rest some 300 feet beyond the span, one wheel off the bridge, with 100 feet of destroyed bridge railing behind. The Caterpillar slid from the truck bed, over the side of the causeway, and into the bay—which was fifteen feet deep at that point with another 40 feet of mud on the bottom.

Maintenance crews from Port Lavaca, welders from District 13 shops at Yoakum, and personnel of the construction company were immediately summoned. Efforts began to repair the bridge and retrieve the tractor.

By 6 o'clock the next afternoon, the tractor was raised, and the bridge repaired and reopened to traffic.

A part of the automatic arm-gate assembly dangles off the Causeway after being struck by the Caterpillar-loaded truck. The Caterpillar lies below in fifteen feet of water. In the background is the wind portal of the bridge, now distorted after collision with the truck. »

Frank Krencak, Skilled Laborer, foreground, from the Port Lavaca Warehouse, uses an acetylene torch to heat a bolt to bend it back into correct position.



Problems were many, both above and below the bridge. Here, skin divers discuss the most efficient means of raising the Caterpillar, which is upside down on the Bay floor.

District 13 shop and Port Lavaca maintenance personnel repair the single-bascule span on the Causeway.

The final step in putting things back in order came as the Caterpillar, dripping and muddy, was raised from the Bay floor.

SURVEY CREW AHEAD

In the past, survey crews have used conventional ROAD REPAIRS barricades in the immediate vicinity of their activity. Passing motorists, seeing these signs but on some occasions not observing any evidence of heavy highway equipment, often continued through the work area at normal speed. Such a practice placed the lives of the survey-crew members and the safety of their equipment in jeopardy.

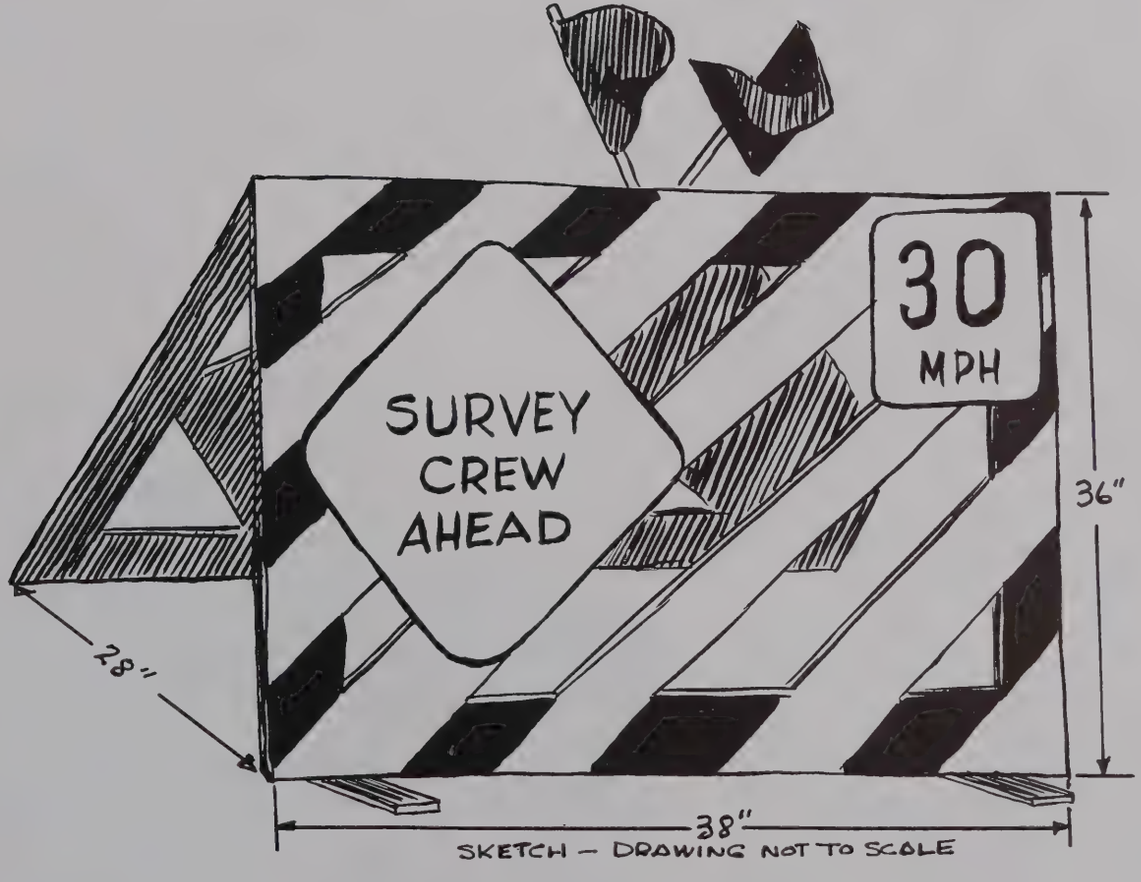
The idea for a new type barricade for placement in areas of surveying activity originated in District 21 with Party Chief E. H. Duke. Duke asked for a wording change to indicate that surveying parties were in a given area. Sam Cox, Senior Resident Engineer, discussed the problem with Tracey L. Haliburton, Senior Maintenance Superintendent, and Jack Bryan, Sign Supervisor.

The wording — SURVEY CREW AHEAD—was decided upon as most effective. Construction of these new signs, and the materials used in them, went through several months of evolution. District 21 now has derived what it believes to be the best sign.

The signs are small enough to fit in the survey-crew station wagon, yet large enough to be visible from a quarter of a mile away. Each sign contains breather holes to keep it upright even when passed by the largest trucks and buses.

Placed on the center stripe of the highway, the new barricade forces the motorist to slow down and drive onto the shoulder. Observation has shown that use of the new type barricade has increased driver-to-sign obedience from 40 to 90 per cent.

This rear view of the barricade shows breather holes which prevent the sign from blowing over. Sections of belting attached to the bottom enable the barricade to be nailed to the pavement.



These dimensions are used by District 21 in constructing the survey-warning barricade, each measurement reduced except for the standard size of the warning placards. In some cases, these barricades are mounted on casters and equipped with a handle, permitting the painter applying station numbers to pull the barricade along with him as surveying continues down the highway.

CORPUS CHRISTI ACCIDENT

What does a person think about when he's falling to the ground from more than 100 feet in the air? Few can answer that question. However, H. D. Oliver, an employee of the American Bridge Company, can speak with authority on the subject.

On November 25, Oliver fell from the top of the steel framework on the Corpus Christi Ship Channel Bridge. Oliver is alive today—the only reason is a small, narrow mudhole which was in the right place at the right time. He is in good condition in a Corpus Christi hospital.

The accident occurred as Oliver and his crew were removing a temporary beam from the bridgework. The beam suddenly swung around, pushing the men into a small group, with one man in danger of losing his balance. Oliver reached out to help him but lost his own balance. He found himself falling, made several attempts to grab the passing framework, but failed. He fell 110 feet into a mudhole, sustaining a broken leg and bruises.

Oliver is the third workman to fall from the high-bridge construction site. The other two men fell earlier while working on the structure and the prestressed concrete beam spans. Both died following falls of 30 and 60 feet respectively.

What does Oliver plan to do when he gets out of the hospital? Like any man who has a love of steel, he plans to keep right on building bridges.

Oliver fell from this point on the bridgework into a mudhole 110 feet below.

AWARDS

Every day of every month some employee of the Texas Highway Department chalks off the anniversary of another working year. During the last six months of 1958, a total of 141 employees in the 25-, 30-, and 35-year category received a salute from the Department in the form of Certificates of Service and pins. More than 39 centuries in man-years with the Highway Department is the calculation the adding machine came up with on this group.

35-YEAR AWARDS

D-1
- R. J. Hank, Administrative Engineer

D-4
- C. J. Collin, Senior Warehouse Superintendent

District 4
- G. K. Reading, Supervising Resident Engineer

District 9
- S. L. Hancock, Senior Maintenance Foreman
- C. L. Law, Skilled Laborer

District 10
- T. C. Hitt, Construction Foreman

District 17
- E. V. Kennedy, Skilled Laborer

District 20
- L. C. Cooper, Senior Maintenance Foreman
- J. P. Fuller, Senior Maintenance Superintendent
- M. G. Hayes, Senior Maintenance Superintendent

30-YEAR AWARDS

D-4
- J. G. Maguire, Senior Accountant
- John Mares, Senior Procurement Supervisor

D-5
- H. M. Taylor, Senior Office Engineer

D-15
- W. B. Averyt, Right of Way Administrative Engineer

D-21
- Fred D. Lee, Porter

District 1
- H. M. Dyer, Senior Designing Engineer
- T. P. Fizer, Senior Maintenance Foreman
- J. R. Holloway, Skilled Laborer
- R. R. Smith, Skilled Laborer

District 2
- H. R. Pipkin, Supervising Construction Engineer

District 3
- O. A. Lindsey, Semi-Skilled Laborer
- J. H. Todd, Skilled Laborer
- S. M. Varnell, Skilled Laborer

District 4
- J. D. McDowell, Senior Maintenance Foreman
- J. L. Payne, Senior Right of Way Agent

District 6
- K. E. Duckworth, Senior Maintenance Foreman

District 7
- R. A. McCulloch, Senior Resident Engineer
- W. E. Macek, Senior Maintenance Foreman

District 8
- A. J. Ball, Senior Maintenance Foreman
- E. C. Fenton, Skilled Laborer

District 9
- J. E. Brewer, Construction Superintendent
- L. C. Carter, Skilled Laborer
- W. H. Compton, Senior Maintenance Foreman
- E. D. Davis, Equipment Supervisor
- L. E. Lewis, Skilled Laborer
- W. C. Owen, Skilled Laborer
- W. C. Petty, Skilled Laborer
- J. J. Pollock, Skilled Laborer

District 10
- I. A. Bradshaw, Skilled Laborer
- J. R. Dike, Senior Maintenance Foreman
- R. F. Henderson, Skilled Laborer
- C. F. Rix, Chief Inspector

District 11
- J. J. Potts, Skilled Laborer

District 13
- R. R. Savely, Skilled Laborer
- C. H. Vaughan, Senior Maintenance Foreman
- H. C. Veazey, Assistant District Engineer

District 14
- Joe Brooks, Senior Maintenance Foreman
- J. M. Owens, Assistant District Engineer

District 15
- Gustav Biermann, Skilled Laborer
- M. J. Kohr, Senior Warehouseman

District 16
- Ernest Kallus, Skilled Laborer
- Toribio Rocha, Skilled Laborer

District 17
- E. F. Mahlmann, Skilled Laborer
- J. M. Riley, Skilled Laborer
- R. C. Stone, Skilled Laborer

District 18
- J. R. Kirkpatrick, District Designing Engineer
- O. J. Springfield, Senior Instrumentman

District 19
W. A. Carson, Senior Maintenance Foreman
Addie A. Johns, Chief Inspector
R. C. Johnston, Senior Maintenance Superintendent
L. T. Pilant, Construction Foreman

District 20
J. T. Middleton, Senior Right of Way Agent

District 21
S. R. Busby, Assistant District Engineer
Joaquin Chavarria, Semi-Skilled Laborer
C. T. Russell, Skilled Laborer
J. F. Snyder, District Engineer

District 22
W. L. Ford, Senior Maintenance Foreman

District 23
R. E. Brookshire, Senior Maintenance Foreman

District 24
L. E. Wood, Senior Resident Engineer

25-YEAR AWARDS

Administration
Clara W. Bewie, Secretary to Commission

D-5
Irene M. Carlson, Senior Secretary

D-9
J. D. Hubbert, Senior Laboratory Assistant

D-12
Marie Conrey, Senior Secretary

D-13
H. L. Arno, Director of Personnel

D-18
Travis Brown, Senior Buildings Engineer
Evelyn Fain, Senior Office Assistant

District 1
J. W. Cravens, District Administrative Engineer
J. L. Soward, Chief Inspector

District 2
J. M. Bingham, District Maintenance Engineer
A. W. Boyd, Senior Resident Engineer
S. B. Pearson Jr., Skilled Laborer
R. L. Stalcup, Senior Maintenance Foreman
W. O. Thomas, Chief Inspector
C. S. Tilley, Senior Resident Engineer

District 4
J. W. Melius, Senior Maintenance Foreman

District 5
E. E. Anthony Jr., Senior Maintenance Foreman
J. T. Warden, Skilled Laborer

District 6
W. A. Davis, Senior Resident Engineer
M. M. Tercero, Skilled Laborer

District 7
A. E. Rusk, Semi-Skilled Laborer

District 8
B. R. Wilkinson, Supervising Resident Engineer

District 9
H. E. Chiles Jr., Senior Right of Way Agent
C. D. Lindsey, Skilled Laborer
C. H. Lipsey, Chief Inspector
C. C. Mitchell, Maintenance Foreman

District 10
W. D. Harris, Senior Resident Engineer
D. W. Heard, Chief Inspector
S. B. Oliver, Chief Inspector
D. L. Smith, Skilled Laborer

District 11
P. M. Townsend, Warehouseman

District 12
S. W. Hoke, Senior Maintenance Foreman
J. W. King, Skilled Laborer
F. L. Simpton, Skilled Laborer
E. C. Weaver, Skilled Laborer

District 13
A. J. Baca, Skilled Laborer
G. O. Bloodworth, Skilled Laborer
W. A. King, Senior Resident Engineer
S. O. Pirkle, Chief Inspector
R. E. Rinn, District Auditor
F. R. Smalley, Skilled Laborer
P. B. Sutton, Skilled Laborer
J. D. Vogt, Senior Warehouseman
R. C. Vogt, Semi-Skilled Laborer

District 14
E. F. Bartz, Senior Maintenance Foreman
J. F. Figer, Skilled Laborer
B. W. Kunz, Skilled Laborer
W. E. Thompson, Chief Inspector

District 15
J. A. Baer, Chief Inspector
C. W. Baxter, Senior Laboratory Engineer
G. W. Ethridge, Semi-Skilled Laborer
R. O. Lytton, District Designing Engineer

District 16
T. O. Foster Jr., District Engineer

District 17
L. S. Brown, Chief Inspector
J. N. Hay, Senior Party Chief
J. A. Teamer Jr., Senior Designing Engineer

District 18
R. E. Gilder, Skilled Laborer
W. A. Harper, Senior Resident Engineer
J. E. Matthews, Skilled Laborer
E. A. Padgett, Skilled Laborer
W. H. Pennington, Skilled Laborer
R. E. Stewart, Junior Inspector

District 19
G. W. Wade, Skilled Laborer

District 20
H. F. Gray, Senior Right of Way Agent

District 21
Gonzalo Garcia, Senior Maintenance Foreman
Fidencio Olvera, Skilled Laborer

District 22
E. A. Boehme, District Auditor
G. D. Fisher, Senior Shop Foreman
C. W. Miller, Senior Equipment Supervisor

District 23
J. B. Crutchfield, Chief Inspector
S. R. Etter, Senior Warehouseman
W. H. McNutt, Skilled Laborer
J. M. Smith, Skilled Laborer

District 25
G. M. Gregory, Skilled Laborer

Soil Constants: Quick Tests

James F. Todd, Senior Laboratory Engineer
District 14

The need for quicker test results on base materials produced from new pits or quarries has prompted the District 14 Laboratory to conduct a series of tests to reduce the time involved in determining the soil constants of any material normally used as a base.

Usually, several days elapse before test results are available on material produced the first day from a pit or quarry. The District 14 Laboratory now has a test procedure that gives accurate results with such time saving that it is possible to submit a sample by 9 o'clock one morning and receive complete test results by 1 o'clock the following afternoon.

The time reduction in this test procedure has been accomplished by use of a detergent and settling agent. A detergent in solution with the water to wash soil binder through the 40-mesh sieve immediately after the test sample has been received from the project completely eliminates the drying and slaking time—a saving of some 24 hours.

After a sample has been washed through the 40-mesh sieve, the small soil particles are in suspension in the water and normally require a long settling time before the excess water can be drained off. Many samples take 48 hours to settle, and in the case of iron ores or granite gravels, a much longer period is necessary to completely settle a sample. This reluctance of the small particles to settle out of the wash water has been overcome by using a settling agent. The most difficult soil particles can be completely settled in four to five hours.

The detergent is used in the ratio of one cubic centimeter to 2,000 cubic centimeters of water. Of this solution, only 1,000 cubic centimeters are used in each test. The settling agent was produced by the District Laboratory by placing 20 grams of lime in 2,000 cubic centimeters of water, stirring gently, allowing to settle for a few minutes, and then draining off the liquid. This liquid was immediately filtered through two layers of regular filter paper to remove any solid matter in suspension. Of the filtered liquid, 100 to 500 cubic centimeters per sample are used as the settling agent. In most samples 100 cubic centimeters are sufficient, but in difficult samples like iron ore, 200 to 500 cubic centimeters are required for very quick results.

The method of using the detergent and settling agent is very simple. A sample is prepared in the usual way of quartering to get it to proper size. Then the sample, without drying, is placed in the 40-mesh sieve and immersed in the 1,000-cubic-centimeter solution of detergent and agitated until it is evident that all soil binder has been removed from the large aggregate. This requires from two to fifteen minutes. The sample is then completely rinsed with around 2,000 cubic centimeters of plain water.

The soil binder has now been separated from the large aggregate and is in a soltuion of about 3,000 cubic centimeters, of which 1,000 cubic centimeters is the detergent solution. To this solution of approximately 3,000 cubic centimeters is now added 100 cubic centimeters (or up to 500 cubic centimeters) of the settling agent, and the sample is set aside for the soil binder to settle. All material left after washing through the 40-mesh sieve must be kept, dried, and weighed. This weight, with the soil-binder weight, is used to compute the soil-binder per cent. From this point forward the tests for soil constants are completed in the standard testing procedure.

Since one-half gallon of detergent will process 3,000 samples, and since the settling agent can be made, cost of this method is negligible. Too, this method is only recommended for samples on which results are quickly needed, as there is no advantage to using it on all samples.

Dependent upon the type of ma-

terial, the time saved by this testing procedure will be one to twelve hours on preliminary drying, one to twenty-four hours on slaking, and four to ninety-six-plus hours on settling.

The District 14 Laboratory used this method of testing on every type base material received in a two-month period—some thirteen different types. Every material tested was split into two equal samples. One sample was tested the usual way, and the other was tested with the detergent and settling agent. There were 27 of these companion tests made and all compared favorably.

There is only two-tenths of 1 per cent of the lime that goes into solution, and our checks show that one-tenth of 1 per cent is removed in draining the excess water from the sample. This would leave a total of .001 gram of lime in the sample if 100 cubic centimeters of the lime solution were used as the settling agent. This amount of lime will not affect the soil constants. There appears, however, to be a slight lowering of the shrinkage ratio due to air bubbles caused by the detergent. Since the plasticity index and soil-binder percentages are the important items—and there is no change in these—we feel that this procedure may be used with confidence that accurate and usable results will be obtained.

TESTS RESULTS

(Tests were made by two different men, and there is some variation due to human element.) "A" samples were tested with detergent and settling agent.

Lab. No.	Type of Material	LL	PL	PI	LS	% S.B.
7-58-1216	Sand and Gravel	25.1	18.0	7.1	4.2	44
7-58-1216A	Sand and Gravel	23.7	17.8	5.9	3.6	51
7-58-1221	Adobe	34.2	16.2	18.0	9.7	91
7-58-1221A	Adobe	34.3	16.8	17.5	9.6	92
7-58-1253	Adobe and Clay	45.1	17.1	28.0	13.9	89
7-58-1253A	Adobe and Clay	45.4	17.2	28.2	14.7	82
7-58-1243	Gravel	26.0	17.5	8.5	4.6	27
7-58-1243A	Gravel	24.4	17.8	6.6	4.4	26
7-58-1260	Loamy Caliche	42.5	14.8	27.7	13.4	87
7-58-1260A	Loamy Caliche	43.4	15.5	27.9	13.1	88
7-58-1262	Caliche	33.2	22.8	10.4	3.7	57
7-58-1262A	Caliche	33.0	23.5	9.5	3.4	60
7-58-1267	Adobe Gravel	34.3	16.4	17.9	9.2	58
7-58-1267A	Adobe Gravel	34.3	17.3	17.0	9.4	54
7-58-1269	Clay Gravel	40.9	16.1	24.8	12.6	12
7-58-1269A	Clay Gravel	39.5	16.8	22.7	12.1	13
7-58-1302	Gravel	21.7	16.1	5.6	3.1	34
7-58-1302A	Gravel	21.7	16.2	5.5	3.4	33
7-58-1303	Gravel	28.4	13.2	15.2	7.2	41
7-58-1303A	Gravel	28.7	13.1	15.6	6.8	43
7-58-1306	Brown Sandy Loam	22.6	16.5	6.1		89
7-58-1306A	Brown Sandy Loam	20.2	15.4	4.8	2.5	87
7-58-1311	Sandstone	23.4	18.0	5.4	3.3	10
7-58-1311A	Sandstone	20.4	17.2	3.2	2.3	9
7-58-1324	Rocky Adobe	36.8	19.4	17.4	10.2	55
7-58-1324A	Rocky Adobe	37.8	19.3	18.5	9.7	59

Lab. No.	Type of Material	LL	PL	PI	LS	% S.B.
7-58-1325	Caliche	32.8	19.3	13.5	7.0	61
7-58-1325A	Caliche	33.0	18.6	14.4	6.7	57
7-58-1343	Caliche	26.1	20.1	6.0	2.7	49
7-58-1343A	Caliche	26.0	20.7	5.3	2.1	45
7-58-1344	Caliche	36.5	19.7	16.8	8.0	40
7-58-1344A	Caliche	34.6	19.2	15.4	7.0	47
7-58-1364	Post Oak Gravel	26.5	13.5	13.0	7.0	16
7-58-1364A	Post Oak Gravel	24.2	13.6	10.6	5.6	14
7-58-1374	Post Oak Gravel	18.8	11.2	7.6	4.1	23
7-58-1374A	Post Oak Gravel	20.0	11.4	8.6	4.5	20
7-58-1383	Post Oak Gravel	19.7	13.1	6.6	3.8	11
7-58-1383A	Post Oak Gravel	22.8	13.7	9.1	4.7	12
7-58-1385	Post Oak Gravel	19.6	12.6	7.0	3.7	12
7-58-1385A	Post Oak Gravel	20.1	12.9	7.2	3.4	14
8-58-1419	Caliche	24.0	15.3	8.7	4.1	64
8-58-1419A	Caliche	23.0	14.9	8.1	3.5	72
8-58-1420	Caliche	28.0	18.8	9.2	4.2	53
8-58-1420A	Caliche	26.7	18.9	7.8	3.5	60
8-58-1421	Gravel	23.8	13.6	10.2	4.6	41
8-58-1421A	Gravel	24.0	13.3	10.7	5.2	47
8-58-1426	Gravel	24.1	13.9	10.2	4.6	39
8-58-1426A	Gravel	23.7	13.2	10.5	4.9	39
8-58-1448	Gravel	26.4	13.4	13.0	6.4	37
8-58-1448A	Gravel	25.2	15.3	9.9	5.3	38
8-58-1449	Gravel	23.9	16.1	7.8	4.4	39
8-58-1449A	Gravel	24.8	14.8	10.0	4.9	38
8-58-1610	Iron Ore	26.9	20.7	6.2	3.4	26
8-58-1610A	Iron Ore	26.1	20.2	5.9	2.3	27

The Problems of Drying and Recompacting Subgrades*

B. L. DeBerry, District Engineer
District 11

The problem of drying and recompacting a subgrade is an old problem and will, in all probability, be with us as long as highways are being constructed. The problems are almost unlimited and vary with soil types and climatic conditions, but the end result or purpose of drying and recompacting a subgrade is limited. The purpose of the subgrade is to support the construction equipment during construction and ultimately support additional foundation or base courses without undue displacement. The subgrade should be as nearly uniform in moisture content and density as is possible to obtain under existing conditions.

The two types of subgrade or soil presenting the greatest problem of drying and recompacting in District 15 are clay with a very high plasticity index that has become saturated, and silty sand underlaid with an impervious strata of clay having no subdrainage.

The usual problem on highly plastic clay is to break the material down or pulverize it enough for proper aeration. Equipment used to aerate this material is a motor grader, scarifier, heavy disc plow, and in some instances a pulvimixer. All of this equipment and labor is of little value if Old Mother Nature is not doing her part with some sunshine.

Odd as it may appear, it is my opinion that the tendency is to overdry this type of material. In so doing it is usually easier to recompact and obtain a specified density in a slightly dry condition than at optimum moisture or above. When the material is compacted on the dry side, it has a tendency to regain moisture and cause swelling or heaving.

Drying and recompacting silty sands underlaid with an impervious material presents an entirely different problem than that of highly plastic clays. Aerating and drying the six to eight inches of depth usually being compacted is fairly simple, assuming weather conditions are favorable. But the real problem is the saturated material between the bottom of the subgrade being recompacted and the impervious material. From my experience with this type of subgrade, I think we have about three possibilities. None of them are cheap, nor are they a cure-all for each individual case.

The first possibility would be to remove the material to the depth being recompacted from half of the subgrade width and place it on the other half of the roadbed, then aerate and dry the material below and replace the original material. Repeat for the opposite half of the roadway. This operation is very expensive and could be justified only on very short sections.

The second possibility would be to remove all of the silty-sand material down to the impervious strata and replace it with a more stable material that could be compacted to proper density and moisture content. This is usually more expensive than the first possibility and could be justified only on very small sections delaying an entire project.

A third possibility would be to aerate by blading or scarifying the upper portion of the subgrade periodically over a long period of time until it has dried to a depth required for proper compaction.

In District 15 we use a special item of "Preparation of Subgrade" on the majority of the primary highway projects. This item specifies that the subgrade soils shall be aerated or sprinkled to obtain a uniform percentage of required moisture and then compacted to the extent necessary to provide not less than 98 per cent nor more than 102 per cent of the density as determined by the use of the Compaction Ratio Method outlined in procedure THD-110 of the Texas Highway Department booklet of "Soil Testing Procedures." This item is paid for by the unit price bid per square yard of "Preparation of Subgrade," and the price includes all shaping, scarifying, mixing, processing, blading, sprinkling, compacting and finishing; for maintaining the subgrade, for all manipulation labor, equipment, tools, and other incidentals, except excavation required in removing objectionable material from the subgrade and replacing with approved material. This is paid for in accordance with the provisions governing the item of "Roadway Excavation."

We have been pleased with results obtained using this specification and do not believe the costs have been excessive. Average bid price per square yard on approximately 1,000,000 square yards now under contract is 5 cents with a maximum price of 6 cents and a minimum of 4 cents.

I would be exaggerating slightly if I said we have had no difficulty in securing the desired results, but I can truthfully say that we have encountered trouble on a very small percentage of the work performed under this specification.

In my opinion, we should strive to develop specifications that call for end results which can be checked reasonably accurate and without undue delay, rather than specify methods of operation and certain types of equipment. The contractors and equipment industry will develop methods and equipment to efficiently obtain the specified results.

*Speech presented at the Thirty-second Short Course.

AWARD

The work of the Texas Highway Department during 1957 received recognition from the Institute of Traffic Engineers recently. A Certificate of Recognition was presented to Governor Price Daniel in Austin, November 24. State Highway Engineer D. C. Greer accepted the Certificate for the Department from the Governor. The presentation was made at a luncheon during an all-day session of the Governor's Highway Safety Commission.

This is the first year Texas has received such a traffic engineering award. Annually the Department makes a report on its highway and traffic-engineering progress to the National Safety Council in Chicago. On a basis of such reports from highway departments all over the nation, the Institute of Traffic Engineers makes citations to states meeting certain standards. In a letter notifying the Department that Texas had been selected for 1957, the Institute President, Joseph E. Havenner, wrote, "A review of your report indicated that Texas met or exceeded 90 per cent of the recommended performance standards."

The annual inventory of the Department's traffic-safety activities for 1957 was submitted to the National Safety Council over the signature of M. V. Greer, Engineer of Traffic, Maintenance Operations Division. It revealed—among other statistics—that Texas resurfaced and rebuilt 6,469 miles of existing highways and widened 1,369 miles. Also, on 60 hills and curves, lanes were added for passing. In all categories of highways —two-lane, three-lane, four-lane, or more, divided and undivided—a total of 4,697 miles of new highways was completed. Traffic-engineering activities required 6.3 per cent of the total Highway Department budget, or $15,124,211. Maintenance of traffic-control devices consumed 174,562 man-days last year. The year's sign program cost the Department $1,941,850. For pavement marking, $1,634,509 was spent, with the signal program totaling $159,623.

Others attending the presentation ceremony from the Department were W. R. Welty, Senior Traffic Engineer, Maintenance Operations Division, and Richard Oliver, formerly of D-18 and now with District 16. Walter Klapproth, Traffic Engineer of the City of Austin, who was the first President of the Texas Section of the Institute of Traffic Engineers, represented the Institute at the presentation.

Examples of traffic engineering during 1957 which made the state's roads safer and won the Certificate from the Institute of Traffic Engineers for the Department follow.

« BEFORE—Nine persons were killed and more than 70 others injured in the 60 accidents caused when automobiles jumped the four-foot-wide median barrier shown here and met oncoming traffic head on. Location: The city section of U. S. 75 (Gulf Freeway) in District 12.

AFTER—After completion of a double flex-beam median barrier, reported the Department to the National Safety Council in 1957, there has been no record of vehicles actually jumping over or running through the barrier, and only one fatality in which collision with the barrier was involved. »

BEFORE—The old bridge over San Felipe Creek on U. S. 90 in Del Rio had a 26-foot roadway width.

AFTER—The structure was widened to provide two 26-foot roadways with two four-foot sidewalks and a four-foot median.

BEFORE—Heavy, high-speed traffic experienced a large number of head-on conflicts due to the poor sight distance and the proximity of Loop 13, the annual traffic engineering report stated. Location: On U. S. 81, between San Antonio and New Braunfels, the highway underpass near Fratt, northeast from San Antonio. »

AFTER—A four-lane divided highway eliminated the potential head-on conflicts. Two 40-foot lanes in each direction furnish adequate lateral space for safe passing. Loop 13 is now routed over U. S. 81 by means of a divided structure to remove this former conflict point. »

BEFORE—The wide intersection of State Highway 6 and Speight Street in Waco was hazardous because of the many angles from which vehicles could approach the intersection.

AFTER—The new channelization project, together with the semiactuated traffic signal and safety lighting, has made the intersection much safer for the traveling public. «

BEFORE—The old U. S. 90 in Vidor, Orange County.

INSTITUTE OF TRAFFIC ENGINEERS
CERTIFICATE OF RECOGNITION
1957
presented to
TEXAS
FOR MAINTAINING A HIGH LEVEL OF PERFORMANCE IN TRAFFIC ENGINEERING AS REPORTED TO THE ANNUAL INVENTORY OF TRAFFIC SAFETY ACTIVITIES

On display at the Texas Highway Department's Main Office in Austin, this blue and gold Certificate of Recognition singles out the traffic-engineering achievements of the Department in 1957.

AFTER—This section of U. S. 90 Expressway now replaces the old section in Vidor.

OVER THE HIGHWAYS

Comments . . . from the Traveling Public

We are going to Arizona by a wagon train. Our wagons will be pulled by horses. The wagons will have lights, stop lights, and brakes and signal lights. Advise if there is another regulation in your state.

We would like to spare the horses by taking a third wagon pulled by a farm tractor. This wagon would haul the heavy farm stuff and supplies. Advise if there is a regulation prohibiting the use of a farm tractor on your roads.

Woodrow Wroblewski
Amsterdam, New York

◈ *Come a-runnin'. We suggest you make sure that tractor has rubber tires, though!*

We liked everything about Texas beginning with the courteous treatment of your hostess at El Paso . . . without her information we would very likely have gone into the flooded regions of Mexico. We enjoyed your well-marked roads and highways, also the greenness throughout the territory we covered from El Paso to Laredo.

Mr. and Mrs. De La Torre
Stockton, California

We disliked the fact that in small towns they roll up the sidewalks too early. Of course they do that in every state now. Thanks for the truck stops. Thanks for the rest stops along highway. We liked Texas very much. The people are fine and treated us that way. But we know very little about your great state. Thank you so very much though for the help you gave us.

C. R. Vannice
Indiana

I would like to express my appreciation to the attendants at the Information Bureau in Wichita Falls. To say the least I was surprised at the helpful, courteous information obtained in planning a route from Illinois to California. This type of service is certainly appreciated by all travelers and I would like to suggest my home state, Illinois, set up a similar service.

Bernard Bennett
Springfield, Illinois

We liked the truck driver that gave us a lift when we had pedaled 60 miles in the freezing weather. Also the host of other friendly people we have met. We disliked the extremely cold spell when we were going through Marfa and Alpine. Means of transportation: bicycle. Miles pedaled in Texas: 3,000.

David and Mavis Rudd
Blackpool Lang's, England

To and From Our Readers

For the renewal of my subscription my remittance has been forwarded to you today, through "Bankers Trust Co., 16 Wall Street, New York, N.Y., U.S.A.," by Central Bank Ankara—Turkey.

I'm glad to make you know, and I shall be also much glad to receive it regularly.

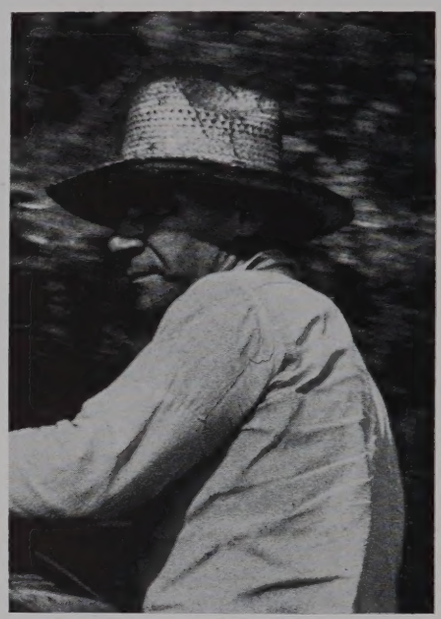
Salim Somer
Ankara, Turkey

Enjoyed your November issue of TEXAS HIGHWAYS very much and especially the section devoted to our maintenance men. It was in this section that I got my start with the Highway Department over 21 years ago.

Page 5 caught my eye as you made the remark about the maintenance worker from the Hallettsville warehouse that sped by so fast while operating an asphalt spray mechanism that your photographer never had an opportunity to get his name.

Although I haven't seen this man's face in nearly 20 years I believe that I can tell you that his name is August Kunha. I wonder if I am right?

Raymond W. Barnes
Chief Dist. ROW Agent
District 2, Fort Worth, Texas.



◆ *We checked and came up with an interesting coincidence. He is Alfonse J. Kupka, a member of District 13's maintenance floating crew. Since the two names are similar, perhaps he is the man.*

"Its my New Years resolution, Dear... no more working late at the office."

About the Cover . . .

Winter comes to East Texas. With it, the lingering scent of pine floats through the valleys and across the hills. This stretch of U. S. 190, between Livingston and Woodville, lies in the heart of Texas' famed piney woods. Wide highways are etched through the land where once roamed the Hasinai, Neche, and Bidai Indian tribes. These highways now connect great centers of industry — lumber, oil, minerals, agriculture, ceramics. But whether in the bustling city or the lonely forest, the subtle scent of pine is everywhere.

TEXAS HIGHWAY COMMISSION

MARSHALL FORMBY	**Chairman**
HERBERT C. PETRY JR.	**Member**
CHARLES F. HAWN	**Member**
D. C. GREER	**State Highway Engineer**

Texas Highways

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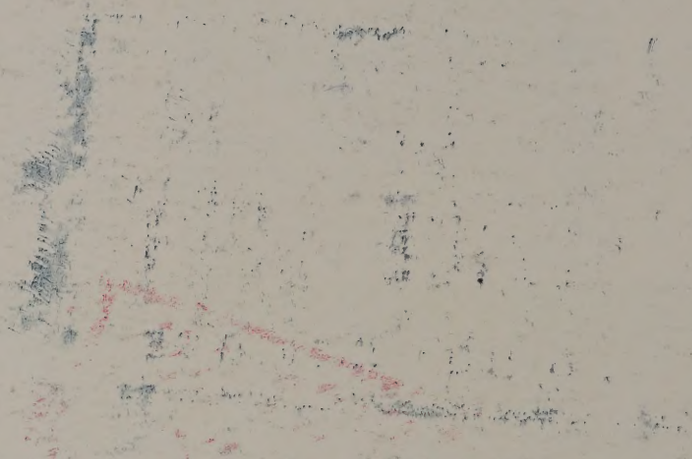
HIGHWAY SIDELIGHTS

Gordon K. Shearer, Director of Research
Texas State Parks Board

The classic beauty and proportions of Mission Espiritu Santo in Goliad State Park has caught the eye of many a photographer and editor alike. Besides its artistic design, the building is famous for the near-perfect acoustics of the church and choir loft, and it has been used for recordings by noted choirs.

At the time when the mission was established, Goliad or La Bahia, as it then was known, was probably the most important place in Texas. It was renamed to honor Hidalgo, leader of the revolution that freed Mexico from Spain. Goliad is an anagram of the letters of his name, omitting the silent "H." Historically, it is most famous for the massacre there of Texans. U. S. Highway 183 bisects the park, and an esplanade from it leads to the Centennial monument placed over the grave of Colonel James W. Fannin and the other victims of the massacre.

Goliad is one of the attractions for Mexico-bound tourists who pass through Texas on U. S. 59.